Lifelong Learning in the Digital Age

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ABSTRACT

Learning through life has been practiced by human beings since ancient times, but it is the accelerating rate of the development of science and technologies that has made it an integral part of people's lives. Digital technologies are an enabler and facilitator of lifelong learning. Online teaching and learning platforms and open education resources are providing multiple opportunities for anyone with a need to learn to acquire knowledge and skills in convenient ways. However, the application of digital technologies is not without obstacles. This article reviews the concept of lifelong learning, and discusses the element of flexibility that is inherent in all aspects of lifelong learning. It proceeds with how digital technologies can support lifelong learning in this sense (flexibility of entry and exit points, age, modality, subject matter and so on) and what the obstacles are in applying technologies to lifelong learning (potential isolation, decreased social interaction and others, and it finally makes recommendations on how to make the best use of web-based learning for all for a balance in its use.

Keywords: Lifelong learning, digital technologies, flexibility, face-to-face communication

Introduction

Definition of Lifelong Learning

Learning is 'a process that leads to change, which occurs as a result of experience and increases the potential for improved performance and future learning' (Ambrose et al., 2010, p. 3). Living things are characterised by their ability to learn. As static as trees appear to be, they also adapt to the environment. An Indian rubber tree will curtail its growth and preserve all its leaves to maintain its level of photosynthesis in low-light conditions; if it is abruptly exposed to a sunny environment, the tree may wither due to its adaptation to a low-light setting.

Human beings, the most intellectually advanced form of life, have been learning from their surroundings and from one another since

ancient times. It is this learning from older generations while in their shelters, or working in the open that has led to the development of human understanding and maintained the 'social continuity of life', that is, the 'continued existence of a society' (Dewey, 1915). The practice of learning through life can thus be traced back to ancient times, but it began to become a prominent one after World War II (Ouane, 2011) when adult education was recognised as 'a permanent national necessity, an inseparable aspect of citizenship (that) should be both universal and lifelong' (MOR 1919 cited in ILO, 2019, p. 3).

According to UNESCO, lifelong learning is 'rooted in the integration of learning and living, covering learning activities for people of all ages, in all life-wide contexts and through a variety of modalities that, together, meet a range of learning needs and demands' (UIL, 2022, p. 1).

The International Labour Organisation defines lifelong learning as 'all learning activities undertaken throughout life for the development of competencies and qualifications' (ILO, 2006, cited in ILO, 2019, p. 7).

Lifelong learning comprises all the phases of learning from pre-school to postretirement, including all spectrums of learning (Laal, 2011 cited in Akther, 2020).

Though a universally accepted definition of lifelong learning is still evasive, practically put, it is learning that takes place with 'any'—learning anything that one needs, at any time, in any place or context, with anybody, at any rate, in any mode and using any means. An umbrella characteristic of lifelong learning is flexibility as it is not restricted by any physical constraints.

Need for Lifelong Learning in the Digital Age

The concept of lifelong learning encompasses three primary phases of learning activities: basic formal education, higher education and continuing education. While basic and higher education lay the foundation for personal growth and development, continuing education, predominantly undertaken by adults, enables them to remain functional in the world of work and social life and to pursue personal interests and hobbies by adapting to new technologies.

Lifelong learning is an integral part of personal growth and development, as it not only enhances social connections and community engagement but also promotes a sense of fulfillment and well-being. With the rapid pace of technological change, mass population movement, demographic shifts and climate change, among several other issues, there is a growing need for more lifelong learning (UIL, 2019, p. 7).

The rate of development in science and technology is accelerating, creating new jobs and rendering knowledge obsolete in shorter cycles. According to the World Economic Forum (WEF, 2020), by 2025, advances in automation and technology may displace 85 million jobs while simultaneously creating 97 million new jobs. Furthermore, the half-life of knowledge, a concept introduced by Fritz Machlup in 1962 to describe the time taken for half of the knowledge in a particular field to become outdated or superseded, is decreasing. A century ago, it took 35 years for half of what an engineer learned when earning their degree to become obsolete. By the 1960s, this time span had reduced to a decade. Today, it is likely even shorter (FS, 2023).

This shrinking half-life of knowledge, coupled with the rapidly changing world, makes it imperative for individuals to engage in lifelong learning to thrive in society. The emerging work culture demands an increasing number of skills, with a 10 percent annual increase in skill requirements for one job. Workplaces are emphasising more remote or hybrid work, digital skills, and managerial functions and support (Muro et al., 2017 cited in Goger et al., 2022).

The Concept of Flexibility in Lifelong Learning

Definition of Flexibility in the Context of Lifelong Learning

Flexibility is defined by Merriam-Webster as the quality 'characterised by a ready capability to adapt to new, different or changing requirements' (Merriam-Webster, 2023). In the field of education, flexibility refers to the ability to adapt learning contents, modes and forms to meet the learning needs of a particular learner. The Open and Distance Learning (ODL) Association of Australia describes flexible learning as a state in which learning and teaching are freed from the limitations of time, place and pace of study (ODL Association of Australia, 2017).

Flexible learning implies a departure from traditional education requirements, where there is no minimum or maximum age for a level of education, no need for regular physical attendance in classrooms, no mandatory three-month term of in-class study to obtain a certificate or accumulate credits towards a degree and no rigid mode of lesson delivery. Instead, learners have the freedom to choose their own learning activities, assessment tasks and educational resources in exchange for different types of credit and costs (ODL Association of Australia, 2017).

The International Federation for Information Processing (IFIP), an organisation affiliated with UNESCO, has identified four elements of flexibility in lifelong learning. These elements include flexibility in time and place, ease of use for both teachers and students, reusability of content, and the ability to add new modules and
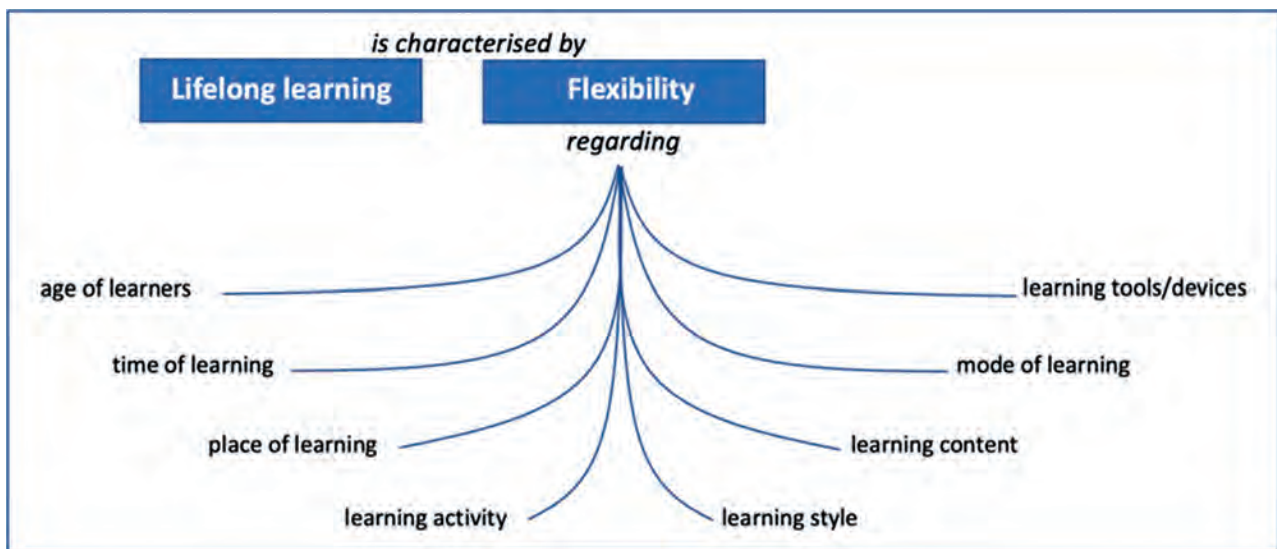
Figure 1. Characteristics of Lifelong Learning Seen Through the Lens of Flexibility.

materials. These elements align with UNESCO's concept of lifelong learning and can be utilised to create a practical model for lifelong learning provision (IFIP, 2004).

Figure 1 summarises the aspect of flexibility of lifelong learning from the above discussion.

In the realm of education, modularisation of learning programmes has been employed to enhance flexibility by enabling learners to have entry and exit points that are tailored to their specific needs. Micro-credentials serve as a solution to time constraints experienced by learners when their employers require only specific skills and knowledge relevant to their work, as opposed to an extensive learning programme. However, flexibility is not solely restricted to learning programmes; learners themselves should be able to adapt to novel methods of acquiring knowledge and skills. As the world continues to evolve rapidly with the emergence of new technologies, it is crucial for learners to stay abreast of the changes. Flexibility allows learners to embrace new technologies and integrate them into their learning process. Moreover, lifelong learning is not exclusively limited to professional or career-oriented skills and knowledge; it also encompasses the pursuit of new interests and passions. Flexibility provides learners with the freedom to explore new areas of study and pursue novel hobbies or interests.

Importance of Flexibility in Lifelong Learning

In contemporary times, humans are experiencing an enhanced quality of life. There are extensive social connections, an exponential increase in knowledge that can be accessed from anywhere, and the ability to improve hobbies by learning from diverse sources. Additionally, health conditions are more stable than in the past. These advancements are a result of learning. However, this modern age brings forth more pressure on individuals who work. They have to complete more tasks, often of higher complexity and unfamiliar nature, and spend longer periods of time commuting due to heavy traffic. This creates a paradox: the growing need to acquire new knowledge and skills, and the shrinking time available for attending classes. Therefore, flexibility in learning is crucial, and all stakeholders in education must provide it. In recent years, flexibility and lifelong learning have become key aspects of education policy in nation-states and bodies such as the European Union and Organisation of Economic Cooperation and Development (Nicoll, 2006).

Edwards (1997, p. 110) has argued for the requirement of flexibility in most aspects of society, including in building a learning society, in the practice of adult education. 'Trends are towards flexibility through such practices as the accreditation (recognition) of prior learning, credit accumulation and transfer, workplace learning, criterion-referenced assessment and student-centred learning. Flexibility is an effective supporter for the realisation of lifelong learning'.

Digital Technologies and Lifelong Learning

Advantages of Digital Technologies in Lifelong Learning

The integration of digital technologies into distance learning has been instrumental in optimising educational practices. In fact, the
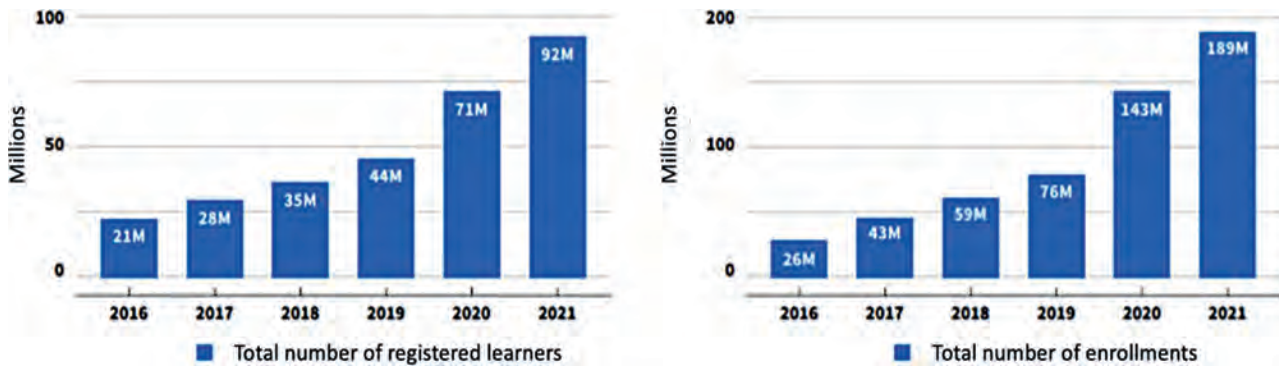
Figure 2. More Learners are Accessing Online Learning.
Source: WEF (2022).

Learning Economy Foundation has referred to current educational practices as the 'Internet of Education', highlighting the extent to which online platforms and technologies have transformed traditional learning environments. In contrast to traditional classroom-based education, online learning features greater flexibility and choice, with asynchronous lectures enabling students to view recorded lessons at their own convenience. Furthermore, a wide range of platforms, such as Coursera, Google Classroom, Khan Academy, LinkedIn Learning (formerly Lynda.com), Skillshare, Udacity and Udemy offer both free and paid courses to millions of learners worldwide. Online meeting platforms, such as Zoom, Microsoft Team and Google Meet, also provide a range of functions to facilitate both teaching and learning. Personalised learning becomes a reality when learners can select the content and tools of learning that suit their individual learning style. The numbers of online learners are increasing steadily. Figure 2 provides an illustrative example of the growth in the number of online learners registered on Coursera from 2016 to 2021, with a sharp increase from 2019

to 2020 due to the COVID-19 pandemic. The World Economic Forum (WEF, 2022) reported that the Asia Pacific region had the largest student presence on learning platforms, with 28 million new online learners enrolling for 68 million courses. This was followed by North America, Europe and Latin America (WEF, 2022).

Overall, the integration of digital technologies into distance learning has significantly transformed traditional education, offering students greater flexibility and access to educational resources. Traditional education resources—books, journals, encyclopeadias, handouts and printed materials, and audio video recordings—are to be accessed in the localities where they are kept. These can be libraries, reading rooms, clubs and bookshops. On the contrary, digital technologies provide access to a wealth of information and resources that can be used for self-directed learning (UNESCO IITE and Open Shanghai University, 2022). Open education resources (OERs) allow access from virtually anywhere as long as there is an internet connection. These are experiencing exponential growth. MERLOT Content Builder,

OER Commons, Curriki and Wikibooks, and Open Culture are among the free OERs. This enables learners to research any topic of interest and access educational content in a variety of formats, including text, video and audio.

Datareportal reports that 42.3% of individuals aged 16–64 utilise the internet for education- and study-related purposes (Figure 3). Nevertheless, this statistic does not account for non-formal and informal learning, as a significant proportion of internet usage for activities such as seeking information (61.0%); watching videos, TV shows and movies (51.5%); and researching how to do things (51.3%) can also contribute to personal learning and social development.

Numerous websites have been developed by individuals, organisations, agencies and educational institutions to disseminate information, knowledge and skills. One such example is YouTube, which offers a plethora of learning opportunities, ranging from household management, gardening and musical instrument lessons to more academic topics such as research methodology and statistics. These online resources are accessible around the clock from any location with an internet connection, thereby elevating informal learning to new heights.

With the world changing at an accelerating pace and knowledge expanding rapidly, new skills and jobs are emerging. This necessitates constant revision and updating of learning programmes. Printed textbooks are static, and digital materials offer a solution to this rapid change. E-learning courses can be quickly and easily updated to provide learners with access to the latest information and knowledge in their field. In addition, subject matter experts who are actively engaged in the industry or field of study can create and deliver e-learning content, ensuring that the content is up-to-date and relevant.
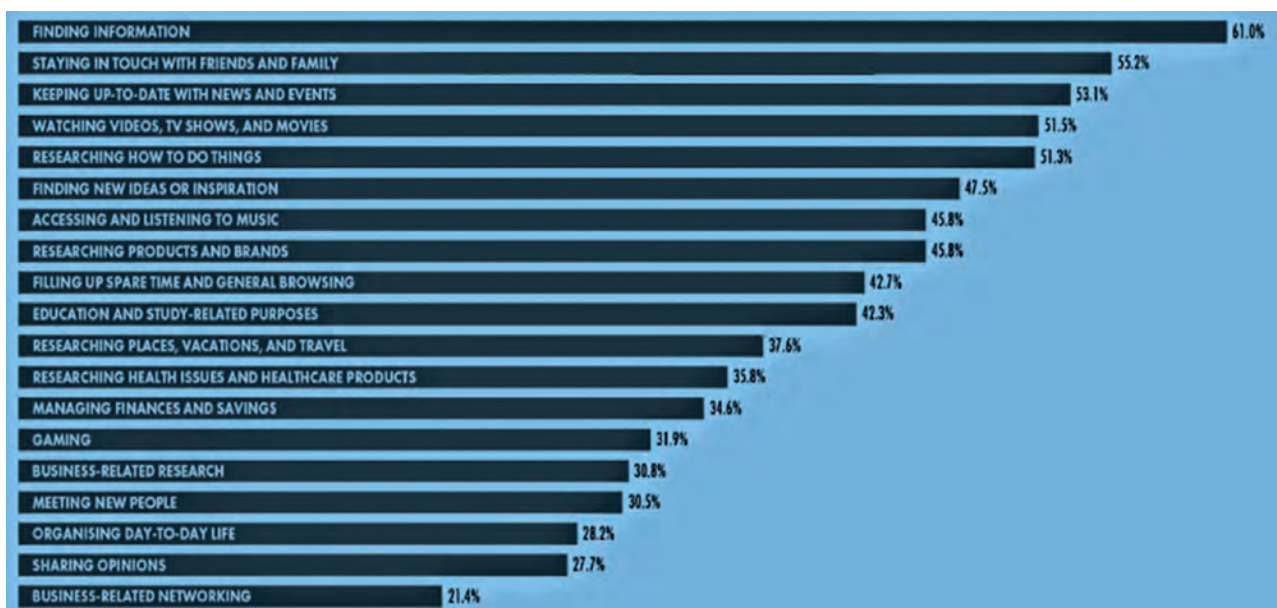

FINDING INFORMATION	61.0%
STAYING IN TOUCH WITH FRIENDS AND FAMILY	55.2%
KEEPING UP-TO-DATE WITH NEWS AND EVENTS	53.1%
WATCHING VIDEOS, TV SHOWS, AND MOVIES	51.5%
RESEARCHING HOW TO DO THINGS	51.3%
FINDING NEW IDEAS OR INSPIRATION	47.5%
ACCESSING AND LISTENING TO MUSIC	45.8%
RESEARCHING PRODUCTS AND BRANDS	45.8%
FILLING UP SPARE TIME AND GENERAL BROWSING	42.7%
EDUCATION AND STUDY-RELATED PURPOSES	42.3%
RESEARCHING PLACES, VACATIONS, AND TRAVEL	37.6%
RESEARCHING HEALTH ISSUES AND HEALTHCARE PRODUCTS	35.8%
MANAGING FINANCES AND SAVINGS	34.6%
GAMING	31.9%
BUSINESS-RELATED RESEARCH	30.8%
MEETING NEW PEOPLE	30.5%
ORGANISING DAY-TO-DAY LIFE	28.2%
SHARING OPINIONS	27.7%
BUSINESS-RELATED NETWORKING	21.4%

Figure 3. Main Reasons for Using the Internet.
Source: Hootsuite cited in DataPortal (2022).

The acquisition of knowledge, skills, integration of social and cultural values and ethics by learners occurs through a layer of constructs, with digital media emerging as an impactful element in the interaction (Figure 4).

In order to promote individual empowerment and lifelong learning, flexible learning strategies and various pathways of learning are required, encompassing both formal, non-formal education and informal learning and academic and vocational skills. This is particularly crucial for those who are marginalised or disadvantaged, as highlighted by the ASEAN in 2016 (ASEAN, 2016). Lifelong learning serves as a means for individuals to enhance their self-awareness and to adapt to changes in culture and technology within society.

The recent COVID-19 pandemic has further institutionalised the applications of digital technologies in education, beyond its function as a mere knowledge provider, to that of a co-creator of information, mentor and assessor, as stated by Haleema et al. (2022). It has become increasingly important to prepare for a future that is unpredictable and constantly evolving, where technology is expected to play a critical role.

Drawbacks of Using Digital Technologies for Lifelong Learning

There is no arguing about the application of digital technologies to lifelong learning. However, from the learners' perspective, utilising these is not without obstacles.

The advent of the internet has further facilitated distant communication, but this presents only one aspect of the issue. 'Humans are social creatures' (Cacioppo & Patrick, 2008, p. X). As social beings, humans are more effectively able to exchange information through direct or face-to-face communication, which incorporates body language, facial expressions, movement and body posture in addition to verbal content expressed through a common language (Pease & Pease, 2006). The renowned authors of the best-selling book *The Definitive Book of Body Language* quote Albert Mehrabian's 7-38-55 formula, which asserts that 55% of the total impact of a message is through non-verbal presentation. However, in online classes or recorded videos, students may miss out on subtle cues conveyed through gestures, body posture and eye contact due to the absence of face-to-face interaction. This can be experienced in work where poor digital communication is a frequent barrier to work, leading to around four hours of wasted time each week (Dhawan, 2022).
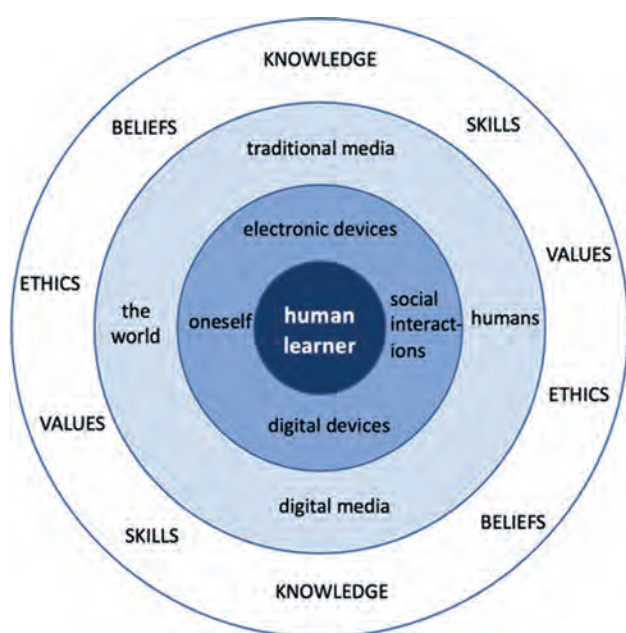

Figure 4. The Means Through Which Learners Access and Learn About the World and Society.

Motivation is an important aspect of effective learning. Adult learners, who voluntarily engage themselves in a learning session due to their need for knowledge and skills that enhance their work efficiency, desire to know more about a topic of their interest or the joy of learning about a hobby they enjoy have strong motivations. Younger individuals may not have a similar level of motivation and may be more prone to distraction.

Online learning also comes with another obstacle: the feeling of isolation or, in other words, the feeling of not being present there, in the learning environment, as the learners are facing a computer screen sitting in their places. According to Lehman and Conceição (2010), two aspects of online presence are required for individuals to cross the threshold of the virtual classroom: telepresence, which is the sense of 'being there' in the context of the classroom, and social presence, which is the sense of 'being together with others".

The internet hosts a vast array of information and knowledge, but not all of it is of high quality, as misinformation and disinformation are common. Therefore, it is necessary to critically evaluate and verify sources before using them for research or other purposes. Digital literacy, which involves the effective and responsible use of digital technologies, is crucial for finding, evaluating, creating and communicating information, as well as protecting personal information and privacy.

The digital divide—the unequal distribution of access to technology and digital infrastructure among different populations—in Southeast Asia is another obstruction. Disparities in access to the internet, mobile phones and other digital devices can be caused by various factors, including disabilities, illiteracy, age, wealth, concentration of economic activity in urban areas and enterprise access to capital. According to a study by Roland Berger, approximately 31% of the adult population in Southeast Asia, or around 150 million individuals, are digitally excluded due to a lack of access to communication technologies or low levels of digital literacy (Accountants Today, 2021). Although digital devices are increasingly present
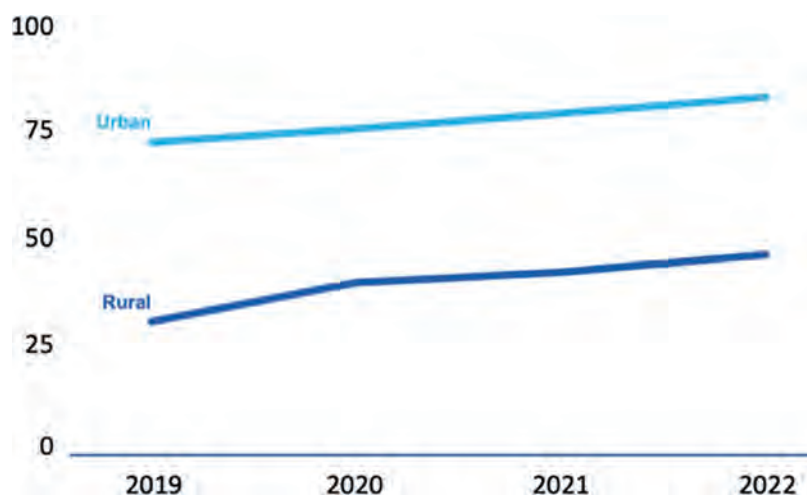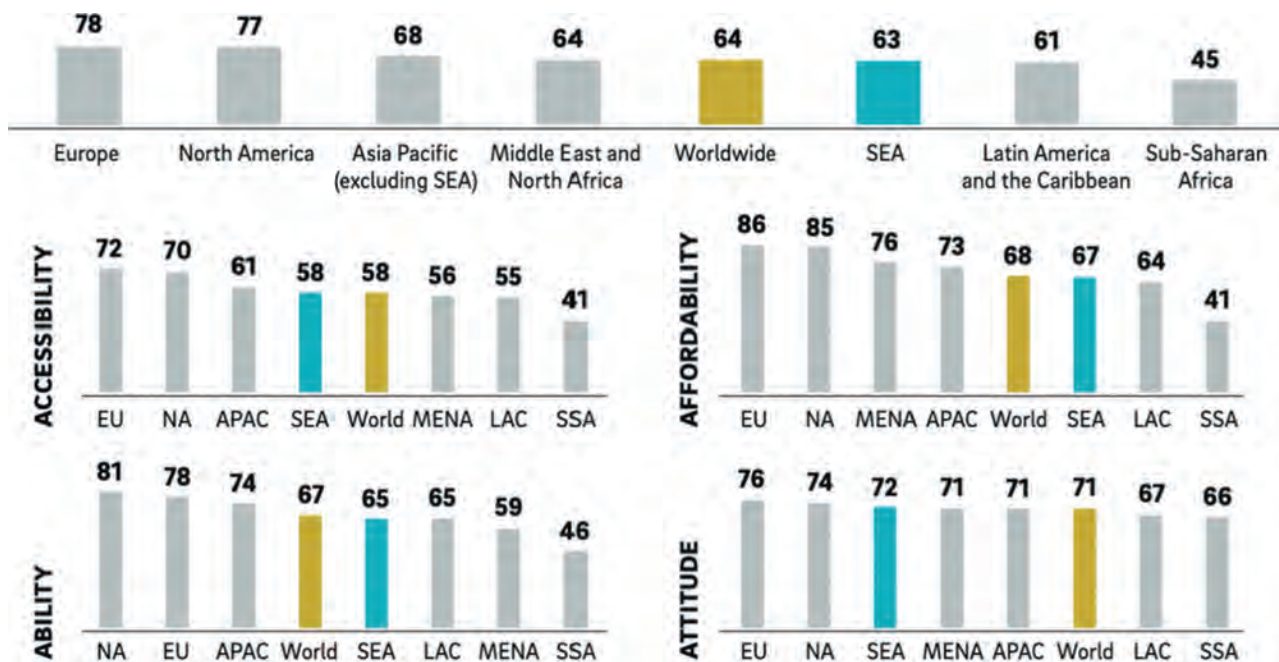

Figure 5. Percentage of Individuals Using the Internet in Urban and Rural Areas, 2019–2022.
Source: ITU (2022).

Figure 6. Southeast Asian Country Rankings in Term of Internet Accessibility, Affordability, Ability and Attitude Towards Using It (Max Score = 100).
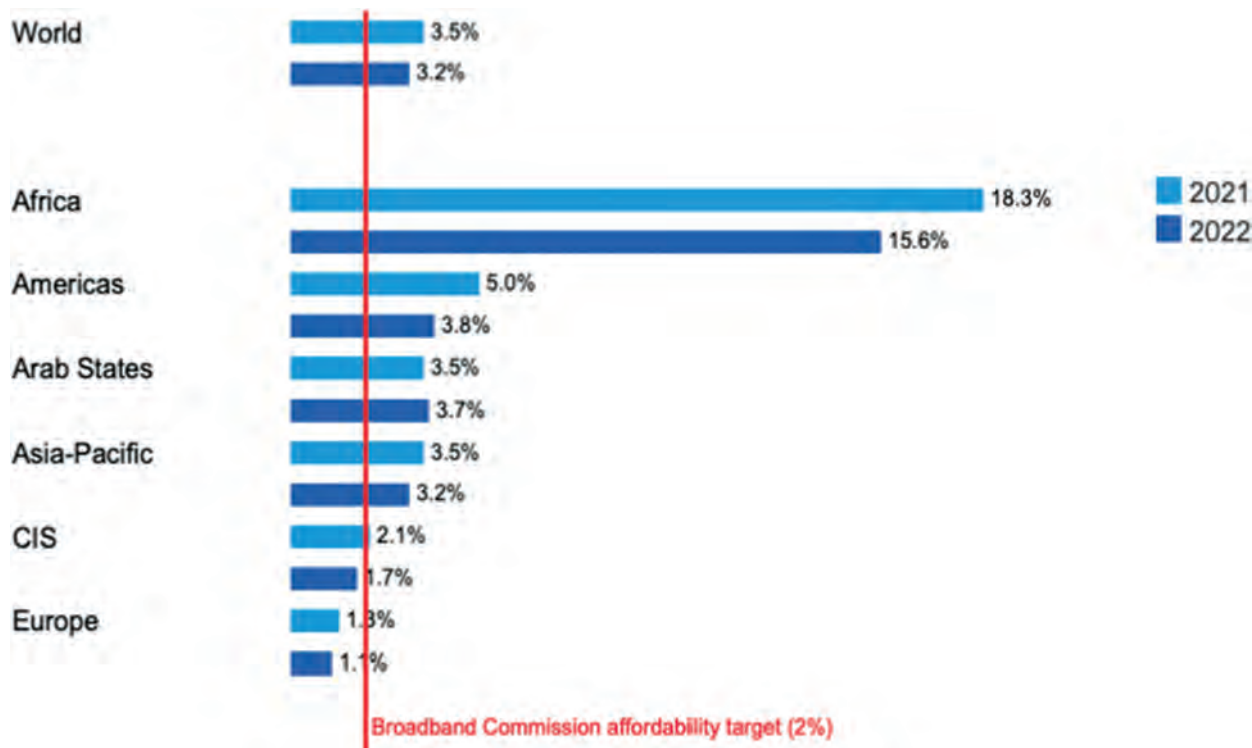**Source:** Low et al. (2021).

Figure 7. Fixed Broadband Basket Prices as Percentage of Gross National Income per Capita, 2021–2022.
Source: ITU (2022, p. 12).

in all walks of life, there remains—as seen in Figure 5—a significant gap of around 40% in internet use between urban and rural areas throughout 2019 – 2022.

Southeast Asia ranked fifth out of seven global regions (Figure 6) in a study of digital inclusion by Roland Berger, a leading global consultancy, due to low scores in the categories of affordability and ability (Low et al., 2021). This is confirmed in a report by the International Telecommunication Union (ITU) which shows that in Asia-Pacific the cost of fixed broadband prices is 3.5% and 3.2% higher than the national income per capita in 2021 and 2022, respectively (Figure 7) (ITU, 2022).

A crucial issue in the implementation of online education is the adequacy of teachers' skills in conducting digital instruction. In response to the COVID-19 pandemic, many educational institutions have been forced to shift towards the use of online teaching modalities in compliance with governmental mandates. As a result, many teachers have been compelled to develop their digital teaching abilities while implementing online teaching, which they had not been trained for.

Recommendations for Successful Lifelong Learning in the Digital Age

Governments, educational stakeholders and the business sector should strengthen collaborative efforts to:

1. Establish governance frameworks that harmonise micro-credentials issued by various educational institutions to enable the transferability of these certifications. This would enable the attainment of digital credentials in a manner that is similar to conventional paper certificates. Additionally, these digital credentials could be accumulated in digital wallets, thereby allowing individual learners to showcase all they have learned throughout their lives.

2. Expand internet infrastructure to cover all regions and areas of a country, with priority given to remote and islandic areas.

3. Provide free opportunities for digital literacy skill acquisition, with a focus on marginalised individuals and those residing in remote areas. Digital competency encompasses not only the ability to use digital devices for information acquisition, but also the capacity to sift through information for valid and reliable facts and data.

4. Develop online teaching methodologies and provide training/retraining for educators in using digital tools, including online platforms that promote collaborative learning opportunities for programme development and course delivery. While digital technologies are emphasised, learning environments should balance online and face-to-face learning opportunities.

5. Create new platforms and software, and improve existing ones so that they facilitate student-student and student-teacher interactions better. Educational insitutions of all levels and modalities should invest to develop their digital maturity.

Conclusion

The convergence of living, working and learning has blurred the boundaries between

these areas, resulting in a seamless integration of daily life activities. Digital technologies, particularly the internet, have made it possible for people to access learning opportunities anytime, anywhere, and through various modes and means that suit their individual needs. The proliferation of educational platforms and tools, as well as the increasing recognition, validation and accreditation of learning outcomes, has opened up new avenues for learners of all backgrounds. This paradigm shift is evident in the growing importance and relevance of non-formal and informal education, which is gaining momentum in Asia and other parts of the world. For instance, iTrain Asia, a private company in Asia, has established a digital learning platform that offers various options for learners across the region. As of this writing, artificial intelligence is emerging as a promising technology that can further enhance self-directed learning among both adults and young learners, enabling them to achieve self-improvement, self-actualisation and contribute to a sustainable world.

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